REMARKS

Reconsideration and allowance of the present patent application based on the foregoing amendments and following remarks are respectfully requested.

By this Amendment, no claims are amended, cancelled or added. Accordingly, after entry of this Amendment, claims 1-32 will remain pending in the patent application.

As a preliminary matter, Applicants would like to express appreciation for the courtesies extended by Examiner Fisher to Applicants' representative during the interview conducted on August 1, 2006 (hereinafter the "Interview"). The substance of the interview is incorporated into the remarks below and constitutes Applicants' record of the interview.

Claims 1-6 and 10-32 were rejected under 35 U.S.C. §112, first paragraph. The rejection is respectfully traversed.

In connection with the rejection of claims 1 and 29, the Examiner alleged that the disclosure was not enabling and that the claims contained subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention.

Specifically, with respect to claims 1 and 29, the Examiner indicated that "there is no limitation that obtains the amount of heat and it is unclear how the 'discharged heat calculating means' actually calculates discharged heat." (*See* page 2, lines 12-17 of the Office Action). Applicants respectfully disagree.

The proper test for meeting the written description requirement is that the corresponding structure (or material or acts) of a means (or step)-plus-function limitation must be disclosed in the specification itself in a way that one skilled in the art will understand what structure (or material or acts) will perform the recited function. (*See* MPEP §2181, II - WRITTEN DESCRIPTION NECESSARY TO SUPPORT A CLAIM LIMITATION WHICH INVOKES 35 U.S.C. 112, SIXTH PARAGRAPH, citing Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1381, 53 USPQ2d 1225, 1230 (Fed. Cir. 1999)).

As explained during the Interview, the corresponding structures of the means plus-function limitations are clearly disclosed in the specification. As such, it would have been clear to those skilled in the art what structure corresponds to the means plus-function claim limitation. (*See* MPEP §2181). Therefore, "one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." (*See* MPEP §2164.01, emphasis added).

For example, with respect to claims 1 and 29, the specification, as filed, describes how the discharged heat amount calculating means obtains the amount of heat discharged. (*See, e.g.*, page 18, lines 12-19 of the present patent application). Specifically, the specification, as filed, discloses that a discharged heat calculation program 92 acquires an amount of heat radiated from each treatment apparatus during their operation. (*See, e.g.*, page 16, lines 19 to page 17, line 14 of the present patent application). The discharged heat calculation program 92 calculates the amount of heat Q1 that is released to the clean room through the housing 10. (*See, e.g.*, from page 18, lines 20-37 to page 21, lines 1-3 of the present patent application). The discharged heat calculation program 92 also calculates the amount of heat Q2 that is removed from inside the housing 10 via the exhaust ducts 31, 32. (*See, e.g.*, page 21, lines 5-19 of the present patent application). The discharged heat calculation program 92 further calculates the amount of heat Q3 that is removed by cooling the water circulating through the pipes 35, 36. (*See, e.g.*, from page 21, lines 21-36 to page 22, lines 1-9 of the present patent application).

With respect to claim 25, and as explained during the Interview, Applicants respectfully submit that the level of carbon dioxide (CO2) generated by each treatment apparatus is calculated using a crude oil conversion/equivalent coefficient. (*See, e.g.*, page 28, lines 34-37 and page 29, lines 1-7 of the present patent application). Specifically, the carbon dioxide emission conversion value for electricity is calculated by multiplying the power consumption by a crude oil conversion coefficient. (*See, e.g.*, page 40, lines 18-37 of the present patent application). In the embodiments describing the calculations of the amounts of CO2 generated as a result of electricity consumption, gas consumption,...(*see, e.g.*, from page 41, lines 5-37 to page 44, lines 1-30), the crude oil conversion/equivalent coefficient used is 0.2 t/MWh. (*See, e.g.*, page 41, lines 2-3 of the present patent application).

Therefore, and as explained during the Interview, it is respectfully submitted that the disclosure, as filed, includes ample embodiments, description and figures that can be used by one skilled in the art to practice the invention without undue experimentation.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-6 and 10-32 under 35 U.S.C. §112, first paragraph, are respectfully requested.

Claims 1-23 and 29-31 were rejected under 35 U.S.C. §103(a) based on Bajuk *et al.* (U.S. Pat. No. 6,324,527) (hereinafter "Bajuk"). The rejection is respectfully traversed.

Claim 1 recites a managing apparatus of a semiconductor manufacturing apparatus, comprising, *inter alia*, factor measuring means for measuring factors needed to obtain the

amount of heat discharged from the equipment used in the apparatus used in the semiconductor manufacturing; and a discharged heat amount calculating means for obtaining an amount of heat discharged on a per unit basis from the apparatus used in the semiconductor manufacturing based on values measured by the factor measuring means. Applicants respectfully submit that these features are not rendered obvious by Bajuk.

Bajuk discloses a model that provides wafer processing cost data from raw wafer through final passivation and parametric testing. (*See* col. 1, lines 35-62). Specifically, Bajuk discloses that model includes equipment costs (power consumption measured at each tool, spare parts, operator staffing, ...), technology costs, factory costs, measurements and sampling costs, costs relating to exposure field size, idle time and contingency costs, rework and scrap cost and validation costs. (*See* detailed description of Bajuk).

However, unlike claim 1, and as acknowledged by the Examiner during the Interview, Bajuk is completely silent and provides no motivation as to obtaining an amount of heat discharged on a per unit basis from the apparatus used in the semiconductor manufacturing based on values measured by the factor measuring means. Bajuk is merely concerned with allocating costs to the manufactured substrates, not calculating an amount of heat discharged by an apparatus to manage the heat budget of the apparatus.

The Office Action alleged that the devices measured under "operation cost" would be those that create the heat discharged and, therefore, would inherently measure the factors needed to obtain the amount of heat discharged. Applicants respectfully disagree and point out that "in relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristics necessarily flow from the teachings of the applied prior art." (*See* MPEP 2112 citing Ex Parte Levy, 17 U.S.P.Q. 2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)). There is no teaching or suggestion in Bajuk that would lead one to conclude that the amount of heat discharged from the equipment is necessarily calculated in Bajuk. It is noted that Bajuk is silent as to calculating a temperature, a flow rate or an amount of heat. Therefore, in the absence of such teaching or suggestion, the features of claims 1-23 and 29-31 cannot be inherent in view of Bajuk.

Claims 2-23 are patentable over Bajuk at least by virtue of their dependencies from claim 1 and for the additional features recited therein.

Claim 29 is patentable over Bajuk at least for similar reasons as provided in claim 1 and for the additional features recited therein. Namely, claim 29 is patentable over Bajuk at

least because this claim recites a managing method of a semiconductor manufacturing apparatus, including, *inter alia*, measuring factors needed to obtain an amount of heat discharged from the equipment used in the semiconductor manufacturing apparatus and obtaining an amount of heat discharged on a per-unit basis for the semiconductor manufacturing apparatus based on the measurements. As mentioned previously and as acknowledged by the Examiner during the Interview, Bajuk does not disclose, teach or suggest these features.

Claims 30-31 are patentable over Bajuk at least by virtue of their dependencies from claim 29 and for the additional features recited therein.

Accordingly, reconsideration and withdrawal of the rejection of claims 1-23 and 29-31 under 35 U.S.C. §103(a) based on Bajuk are respectfully requested.

Claims 24, 28 and 32 were rejected under 35 U.S.C. §103(a) based on Bajuk in view of Frenyo (U.S. Pat. No. 3,961,895). The rejection is respectfully traversed.

Claims 24 and 28 are patentable over Bajuk at least by virtue of their dependencies from claim 1 and for the additional features recited therein. Namely, claims 24 and 28 are patentable over Bajuk at least because these claims recite a managing apparatus of a semiconductor manufacturing apparatus, comprising, *inter alia*, factor measuring means for measuring factors needed to obtain the amount of heat discharged from the equipment used in the apparatus used in semiconductor manufacturing; and a discharged heat amount calculating means for obtaining an amount of heat discharged on a per unit basis from the apparatus used in the semiconductor manufacturing based on values measured by the factor measuring means.

As explained during the Interview, Frenyo fails to remedy the deficiencies of Bajuk. Frenyo merely discloses an apparatus for measuring carbon dioxide produced by organisms contained in certain products such as fruits, crops... (*see* Frenyo at col. 1, lines 14-51). However, Frenyo is silent as to the above mentioned features of claim 1. As such, any reasonable combination of Bajuk and Frenyo cannot result, in any way, in the invention of claims 24 and 28.

Similarly, claim 32 is patentable over Bajuk, Frenyo and a combination thereof at least by virtue of its dependency from claim 29 and for the additional features recited therein.

The Office Action alleged that it would have been obvious to combine the teachings of Bajuk and Frenyo. Specifically, the Office Action alleged that it would have been obvious to use the device of Frenyo in the system as disclosed in Bajuk "as Frenyo teaches this as a

good way to measure carbon dioxide in industrial process." (See, page 7, lines 7-9 of the Office Action). Applicants respectfully disagree.

The Office Action merely states as a conclusion that the combination of Bajuk and Frenyo is obvious because Frenyo's device is allegedly accurate. However, the Office Action must provide reasons for the alleged combination, not a mere statement of conclusion. Specifically, the mere fact that Frenyo discloses a carbon dioxide measuring device does not render obvious or desirable its combination with Bajuk.

In addition, since each of these references is silent as to the other one's features, one of ordinary skill in the art would clearly not be motivated to modify one of these references in view of the other. Bajuk merely relates to a method for calculating wafer processing costs from raw wafer to passivation, but is silent as to measuring dioxide carbon released by food products. Conversely, Frenyo discloses an apparatus for measuring carbon dioxide produced by organisms contained in certain products such as fruits and crops but is silent as to semiconductor processings. Therefore, Applicants respectfully submit that there is no motivation to combine the teachings of Bajuk with those of Frenyo.

Accordingly, reconsideration and withdrawal of the rejection of claims 24, 28 and 32 under 35 U.S.C. §103(a) based on Bajuk in view of Frenyo are respectfully requested.

The rejections having been addressed, Applicants respectfully submit that the application is in condition for allowance, and a notice to that effect is earnestly solicited.

If any point remains in issue which the Examiner feels may be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account Number 033975. The Commissioner for Patents is also authorized to credit any over payments to the above-referenced Deposit Account.

Respectfully submitted,
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